

Model 701 ARBITRARY FUNCTION GENERATOR



The Evans Model 701 provides, for the first time, a convenient, dependable means for generating virtually any desired voltage function of time. While the more common waveforms such as square, triangle, sine, and ramp are available, the 701 is particularly valuable in its ability to synthesize, and also to record and regenerate the unusual.

Up to 256 points plus straight line interpolation are used to develop the function. The interpolating circuit is automatic, thus always assuring a smooth, continuous function with absolutely no operator adjustment or alignment required. The stepwise approximation is also provided for appropriate applications.

Stored in internal memory, the function can be triggered out as a single transient, or as a continuous, periodic waveform. The output is continuously adjustable in amplitude and in dc level, or offset, by corresponding panel controls.

Speeds of generation range from 0.25 to 2×10^5 segments per second. Concurrently on each cycle, a marker pulse, whose position and amplitude are controllable, is supplied. Various other synchronizing pulses are also available for use with external equipment. To initiate a cycle, the internal clock, the panel pushbutton, or the external trigger can be selected. In addition, the function can be generated on a point-by-point basis, either in sequence or with the abscissae selected in any order by external programming, or panel switch.

The Model 701 stores functions as digital data in memory. The contents are modified, or originated, by data supplied from any of three sources. In the first instance, thumbwheel panel switches, used in point-by-point selection, establish abscissae and ordinates. Secondly, BCD data when fed to a rear connector and synchronized with the 701, can be used for coordinate location. The third option is the analogue channel where input voltages are sampled, digitized, and stored in time sequence. Recording speed ranges are the same as those for generation.

All of the operating modes of the Model 701 are accessible in digital fashion to external programming.

It is apparent at once that the Model 701 has exceptional versatility. For example, a single transient from a transducer might be stored, later to be generated repetitively for analysis, then perhaps modified in some respects by the use of the coordinate switches, analyzed further, or, indeed, injected back into the physical system as a perturbed signal. Straight programming of system variables can be accomplished with unusual ease, particularly where it is desired to change the program from time to time.

A view of the interior of the Model 701 shows a special emphasis on clean layout, strength, and compactness. The semiconductors are silicon, a majority of integrated circuits is used, and all materials and components have been selected with reliability as the prime objective.

EVANS  ASSOCIATES

Model 701 ARBITRARY FUNCTION GENERATOR

Some of the fields where this unique new instrument has important applications are

BIOMEDICAL ELECTRONICS
OCEANOGRAPHY
CHEMICAL KINETICS
ENVIRONMENTAL TESTING
REACTOR PHYSICS

STRUCTURES ENGINEERING
HEAT TRANSFER
PARTICLE ACCELERATORS
GEOPHYSICS
INDUSTRIAL CONTROL

APPLICATIONS:

- Generate ordinary or extraordinary functions
- Record/regenerate transients • Digitize oscilloscope traces
- Synthesize waveforms • Program voltage/current sources
- Simulate natural waveforms — e.g., EKG

FEATURES:

- 256 coordinate pairs
- Internal A/D conversion, or point-by-point synthesis
- Programmable • 5 $\frac{1}{4}$ " panel space—light weight

Grid Dimensions	256 x 256 matrix
Fundamental Frequency Range	0.001 to 1000 cps. when using highest resolution
Minimum Rise Time	5 μ sec.
Frequency Stability	Better than 0.25% on internal clock
Maximum incidental amplitude error	$\pm 0.15\%$, all frequencies
Hum	Less than 0.03% of full scale

Front panel controls:

1. GENERATE-RECORD
2. ORDINATE thumbwheel switch
3. ABSCISSA thumbwheel switch
4. RECORD SELECT

0 - 255 units • 10 millivolts/unit max.
0 - 255 units

Selects data for storage from one of

- a. ANALOGUE INPUT
- b. ORDINATE SWITCH
- c. BCD INPUT

5. MANUAL TRIGGER
6. MODE SELECT

Generates or Records

- a. CONTINUOUS
- b. TRIGGERED CYCLE
- c. TRIGGERED SEGMENT-SEQUENTIAL
- d. TRIGGERED SEGMENT-SELECT ABSCISSA

7. RATE

Range switch covering 1, 10, 10², 10³, 10⁴, and 10⁵ segments/second nominal. Continuously variable control. Max. rate, 2x10⁵ segments/second. Min. rate, 0.25 segments/second.

8. AMPLITUDE
9. OFFSET

0 - 2.55 volts continuous control

10. MARKER AMPLITUDE

± 2.55 volts continuous control
0 - 1.0 volt, pulse continuous control

Front panel connections:

1. ANALOGUE INPUT
2. EXTERNAL TRIGGER INPUT
3. OUTPUT
4. SYNCH PULSE-GENERATE
5. SYNCH PULSE-RECORD

Input impedance approximately 1K. Unity gain through record/generate with maximum setting of AMPLITUDE control.

Requires a pulse of at least ± 2.0 volts and 0.5 microsecond. Input impedance approximately 1K.

Analogue function available here.

Output impedance approx. 50 ohms.

1 μ sec., 3 volt pulse.

Occurs before each output segment.

1 μ sec., 3 volt pulse.

Occurs before each point stored in memory.

Front panel indicators:

1. "ON INDICATED ABSCISSA"
2. "CYCLE IN PROGRESS"
3. "POWER"

Lamp is on when location is same as switch setting.

Lamp is on when function is being generated;

off, when on standby, ready for triggering.

Lamp is on when AC power is applied.

Rear panel connections:

1. AC POWER
2. EXT PROGRAM/BCD DATA IN
3. BINARY OUTPUT/SYNCH.
4. MARKER
5. AUX. TRIG. IN

Operating temperature range

10°C to 40°C

Power

105-130 VAC. 50/60 cps. 60 watts median

Dimensions

5 $\frac{1}{4}$ " x 19" std. panel x 15 $\frac{1}{2}$ " deep

Shipping weight

21 pounds

PRICES FOB Berkeley, California

MODEL 701, or 701-PM*.....\$4450

MODEL 703 or 703-PM*. Same as Model 701 except has analogue input only.....\$3675

MODEL 711, or 711-PM*. Same as Model 701 except expanded to 1024 x 1024 grid..\$9450

*PM indicates power wiring for 200-250 VAC, 50/60 cps

EVANS ASSOCIATES

P. O. Box 5055, Berkeley, California 94705 Phone: (415) 653-2616